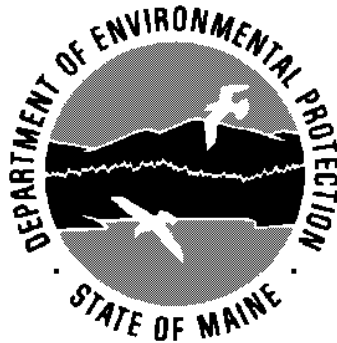


Piscataquis River Data Report

2001 Survey

January 2002

DEPLW0465



David Miller, PE
Land & Water Bureau
Division of Environmental Assessment

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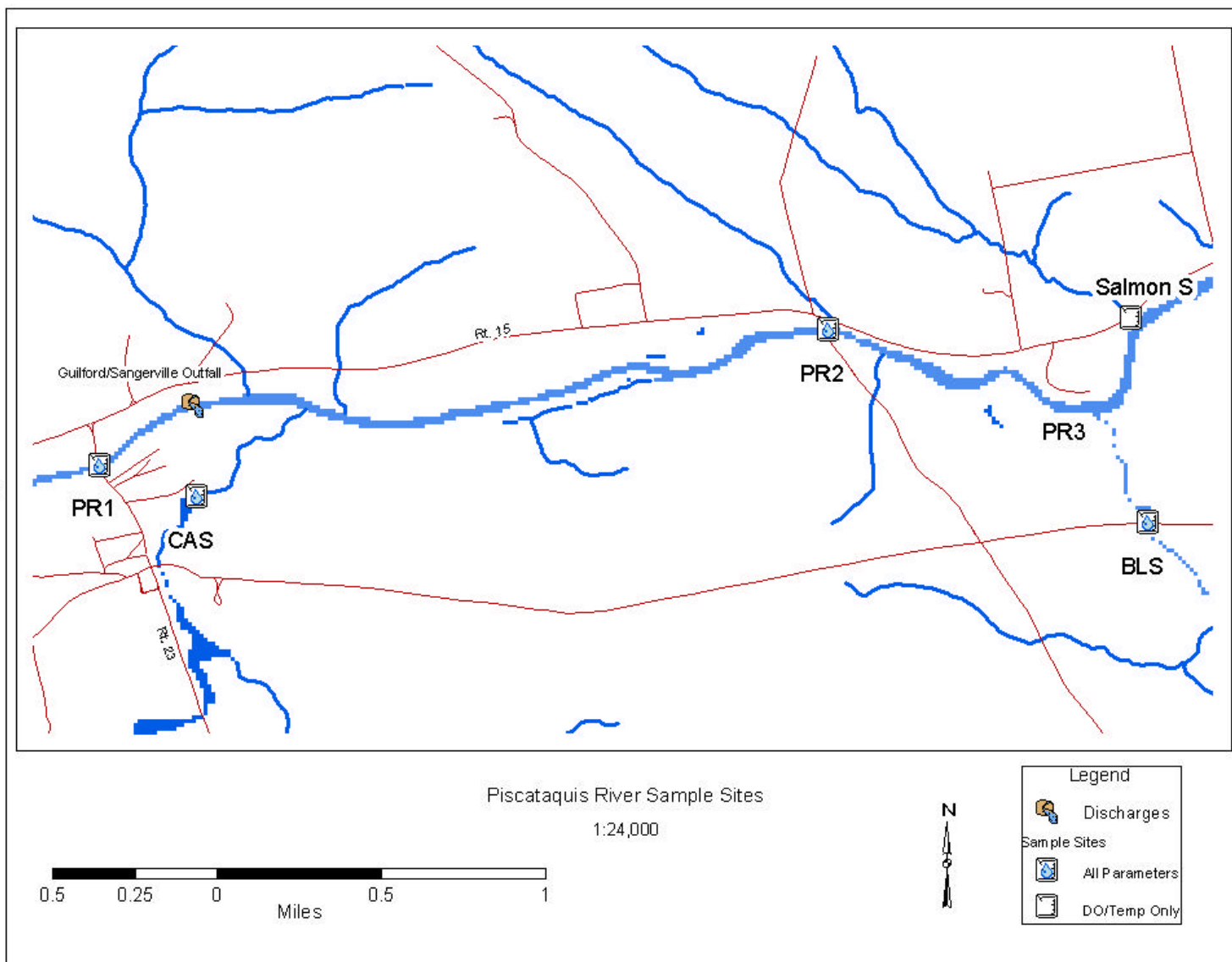
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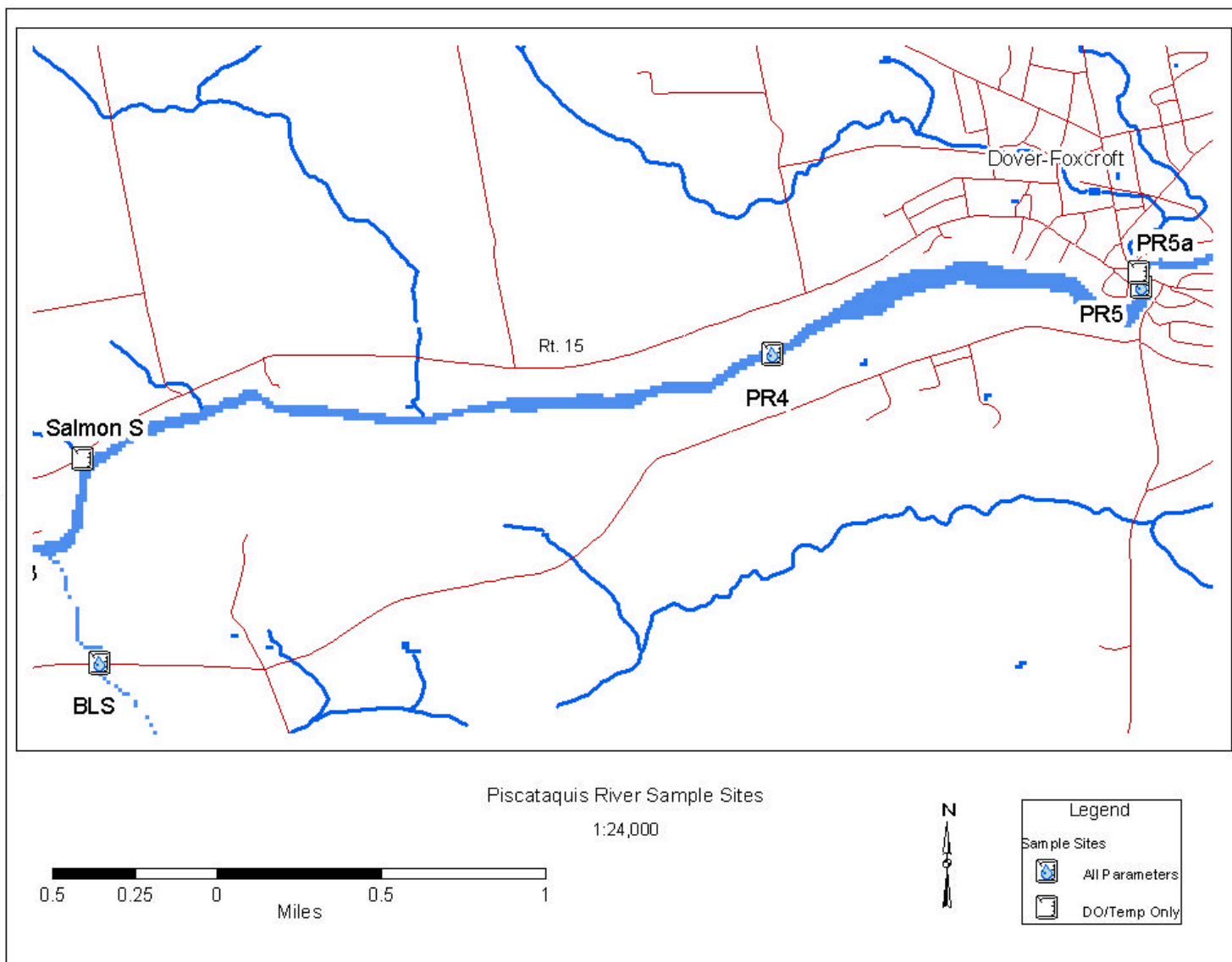
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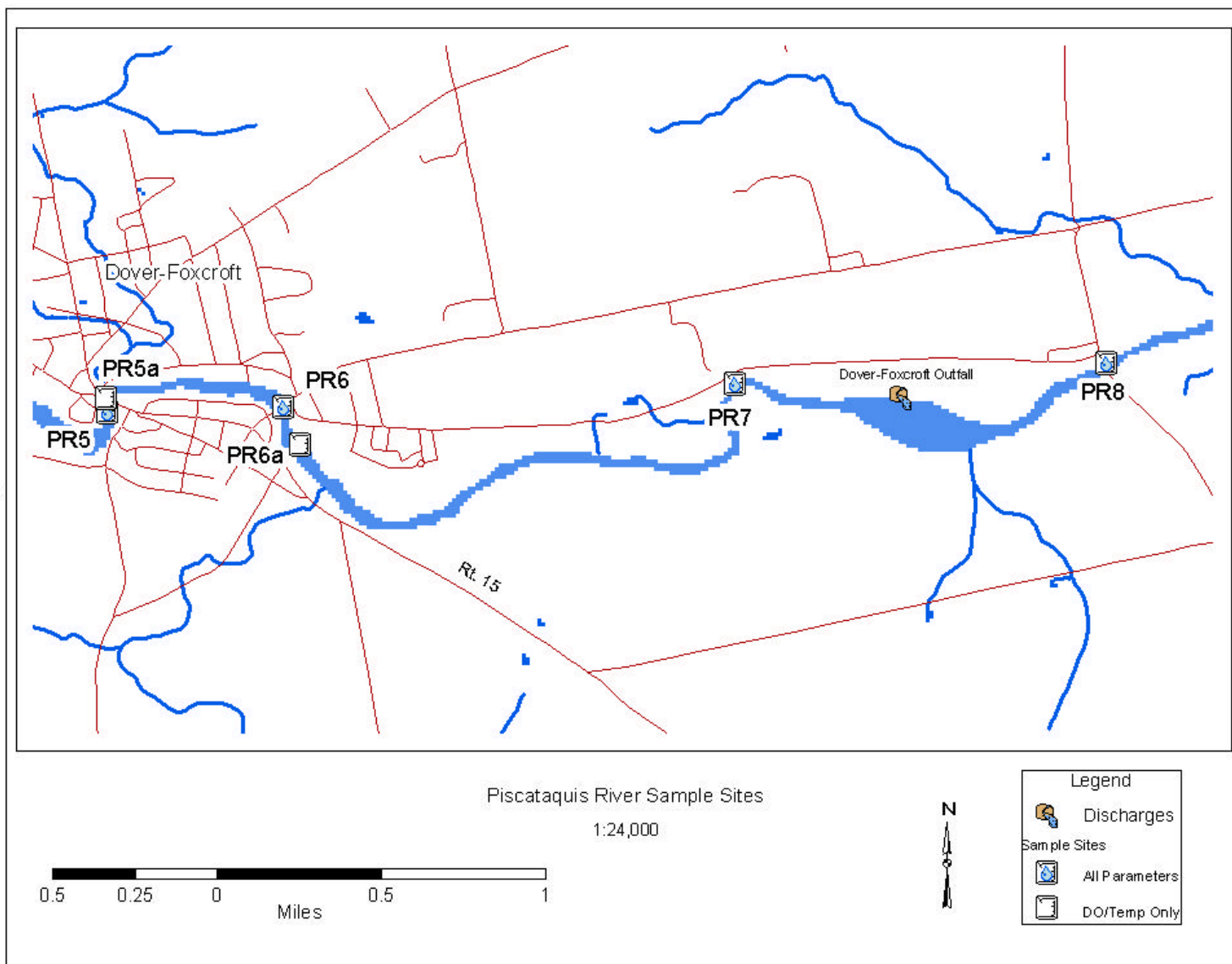
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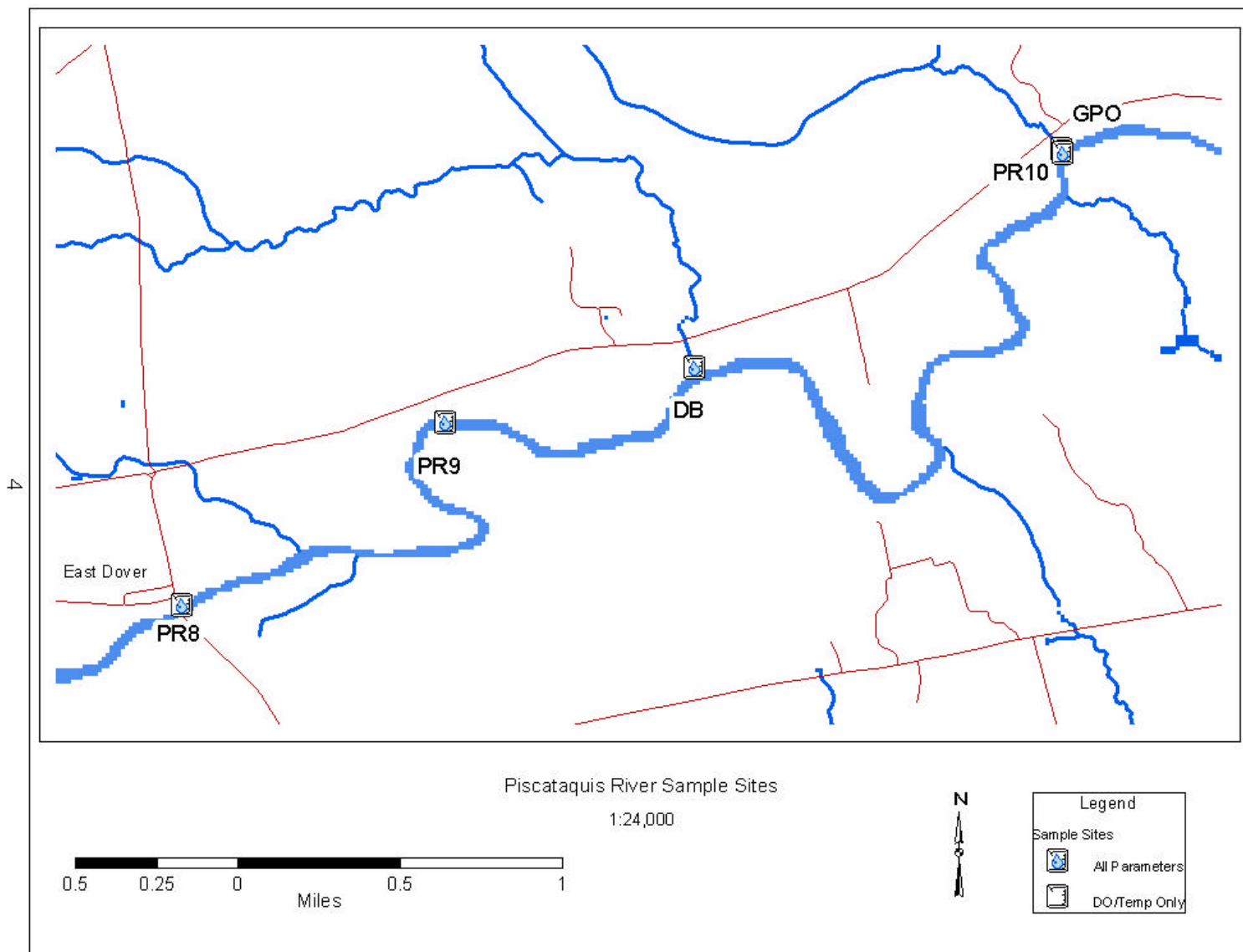
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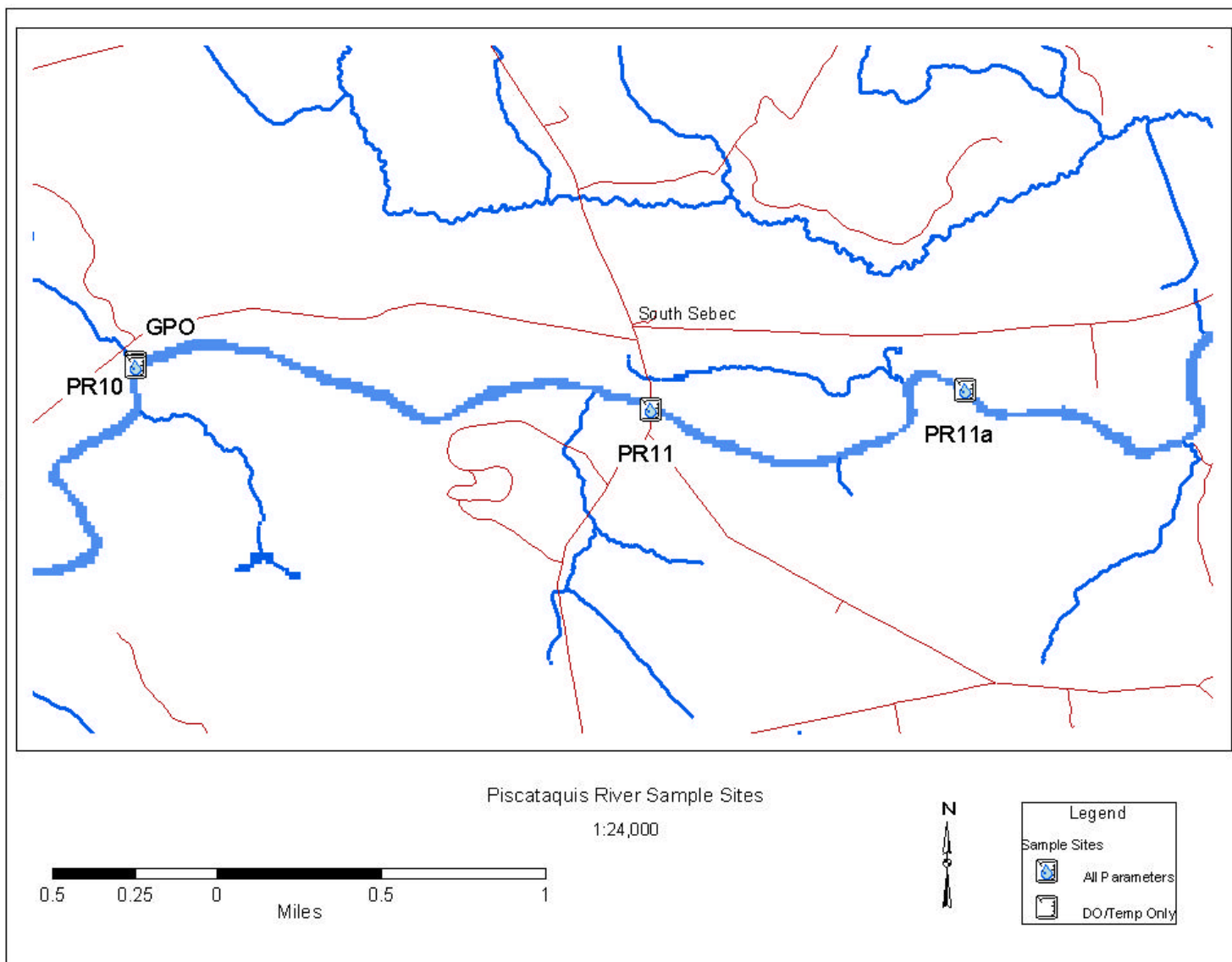
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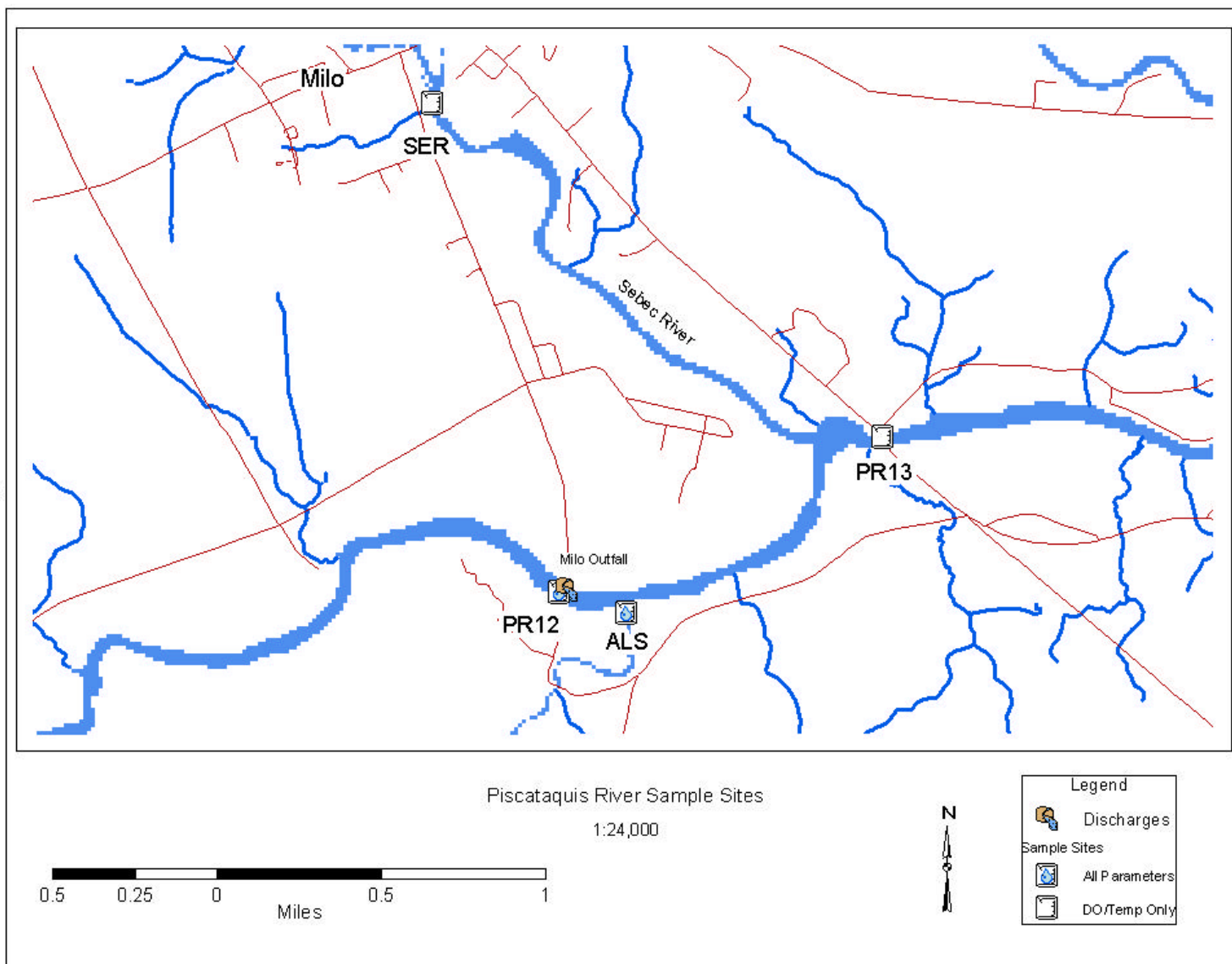












Introduction

The Piscataquis River is a major tributary of the Penobscot River and flows 62 miles from Blanchard to its confluence with the Penobscot at Howland. It has a drainage area of 1453 mi.² at Howland. Below the Milo outfall (near the lower boundary of this study area) the drainage area of the Piscataquis River increases by a factor of three due to the addition of the Sebec and Pleasant Rivers. During the spring/summer of 1997 an effort was initiated to collect water quality data on the Piscataquis for the purposes of evaluating current water quality and developing a water quality model (refer to Penobscot River Basin Work Plan, MDEP, May 1997). The study area included the Piscataquis River from Guilford (Rt. 23 bridge) to Milo as well as major tributaries. The municipal wastewater treatment plants of Guilford/Sangerville (0.93 MGD), Dover-Foxcroft (0.8 MGD) and Milo (0.39 MGD) discharge to the river within this segment. This segment of the Piscataquis River is presently class B requiring among other standards, a minimum dissolved oxygen (DO) concentration of 7 ppm or 75% saturation, whichever is greater.

Two 3-day surveys were planned for 1997 but due to river flow and scheduling problems only one survey was conducted (refer to Piscataquis River Data Report (preliminary), April 1998). During the summer of 1998 an attempt at a second survey was made, but was cut short due to a significant rain event. The abbreviated data from this second survey were presented in the report Piscataquis River Data Report, 1998 Survey, (Data Only), May 1999. During July and August 2001 the second survey was successfully completed (refer to the updated work plan Piscataquis River Work Plan, May 2001). The surveys would not have been possible without assistance from the Dover-Foxcroft treatment facility, Guilford Industries, Guilford/Sangerville Sanitary District, the Penobscot Indian Nation and the Bangor office of DEP.

Data collected during the 2001 survey included water chemistry (nitrogen series, phosphorous series, chlorophyll-a, biochemical oxygen demand), E-coli bacteria, dissolved oxygen and temperature as well as hydraulic data (flows, depth/width at selected transects). QA/QC included field meter checks and field duplicate samples as well as standard lab QA/QC. In a separate effort, MDEP staff biologists sampled for periphyton at several sites on the Piscataquis during 2001. These data results should be available by spring 2002. In addition, EPA collected sediment oxygen demand (SOD) data within the two impoundments during the fall of 2000. This report presents the results of the 2001 effort. A more detailed modeling report will be presented as a follow up to the data reports.

Wet weather or storm event sampling was planned for 2001 focusing on phosphorous, but was not completed because of the dry summer. At this point modeling will proceed with the available data but it is recommended that wet weather sampling be made at a later date.

Hydrologic Data

As part of the data collection for developing a water quality model it is necessary to collect sufficient physical data for representation of the river hydrology. These data include sufficient river flow measurements during each survey to establish a flow balance for the study segment and transect measurements (widths and depths) at representative sites within the study segment. Three USGS flow recording stations are maintained on the Piscataquis River. The flows recorded at the Dover-Foxcroft

station near Lowe's Bridge are shown on a chart on page A4 in the appendix. The following table presents the 2001 flow and stage data. Table 2 presents the results from transect measurements.

Table 1 Flow/Stage Measurements

	DA	Flows, cfs (stage)				7Q10 cfs
		07/30/2001	07/31/2001	08/01/2001	08/02/2001	
Carlton Stream @ mill	25.2	0.4	-	-	-	-
Lowes Bridge	298	32.5	30.9	29.5	26.75	18.7
Black Stream @ bridge	32.16	3.9(4.16)	(4.2)	-	(4.21)	-
Salmon Stream	7.93	-	-	-	-	-
Daggett Brook	5.8	-	0.018	-	-	-
Garland Pond Outlet @ mouth	4.15	-	0.1	-	-	-
S. Sebec Bridge	375	-	34.7	-	-	-
Alder Stream @ mouth	41.5	-	-	0.6	-	-
Upper Impoundment	-	-	(0.38)*	-	-	-
Lower Impoundment**	-	-	-	-	(2.5)	-
Dover-Foxcroft (MGD)	-	0.440	0.260	0.190	0.190	-
G SSD (MGD)	-	0.131	0.255	0.324	0.270	-
Milo (MGD)	-	0.076	0.112	0.099	0.095	-

*at last concrete pad (49th), 45th pad high and dry(est. -1)

**stage=3.02 on 8/23/01

on 8/23/01 Salmon Stream a trickle, GPO was dry, flow at Lowes was 16 cfs

Table 2 Transect Data

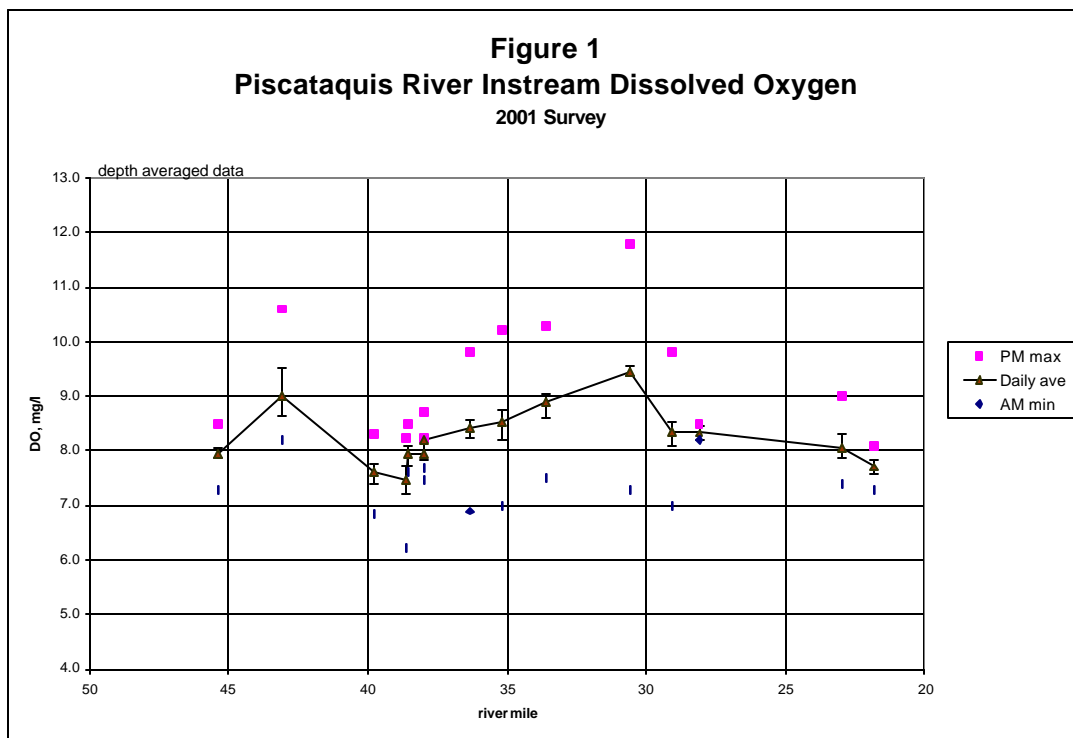
transect	flow cfs	area ft2	ave. depth ft	width ft	vel fps
PT1	14.5	172.7	1.70	97.0	0.084
PT2	14.6	100.9	0.69	140.0	0.144
PT3	16.0	82.8	0.84	94.0	0.193
PT6	16.8	54.7	0.72	74.0	0.308
PT13	17.5	99.2	0.55	175.0	0.177
PT14rev	17.6	92.6	1.39	64.0	0.190
PT16	17.7	75.2	0.93	77.3	0.235
PT17	17.8	302.9	2.51	119.0	0.059
PT19	18.3	138.1	0.96	136.0	0.132
PT20	18.6	125.4	1.01	119.0	0.148
BS1*	34.8	363.4	2.57	136.0	0.096
BS2*	34.9	433.4	2.33	181.0	0.080
BS3*	35.0	597.8	3.92	148.0	0.059
BS4*	35.8	976.2	4.86	194.0	0.037
BS5*	36.9	1055.2	3.87	265.0	0.035

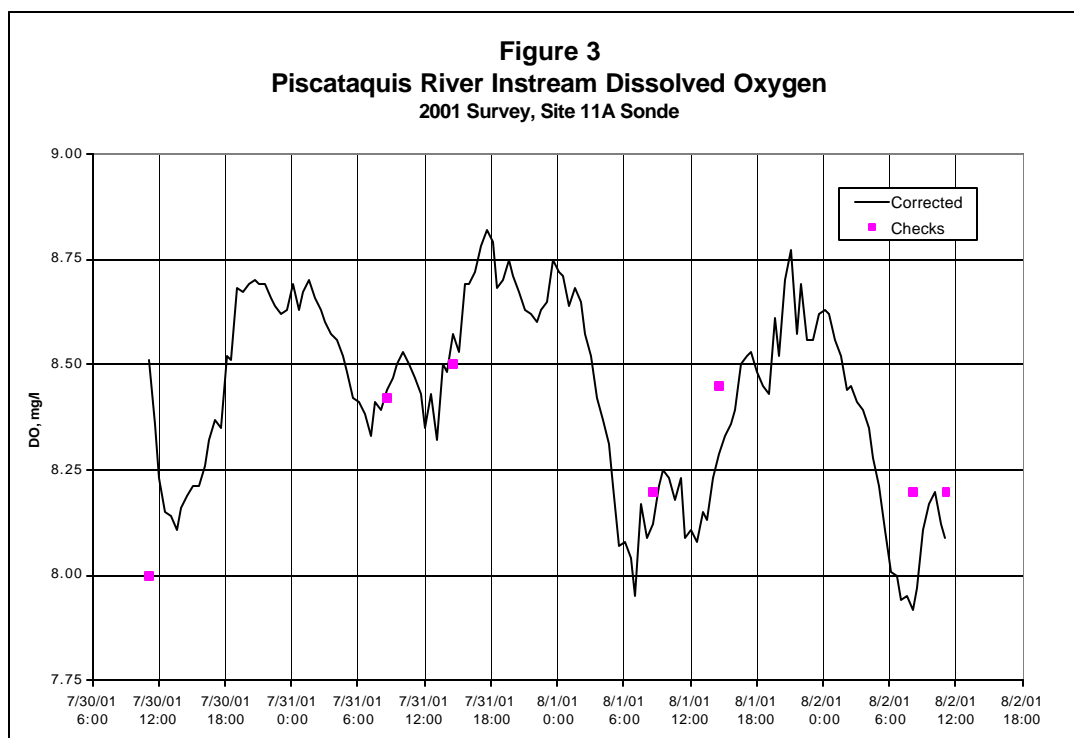
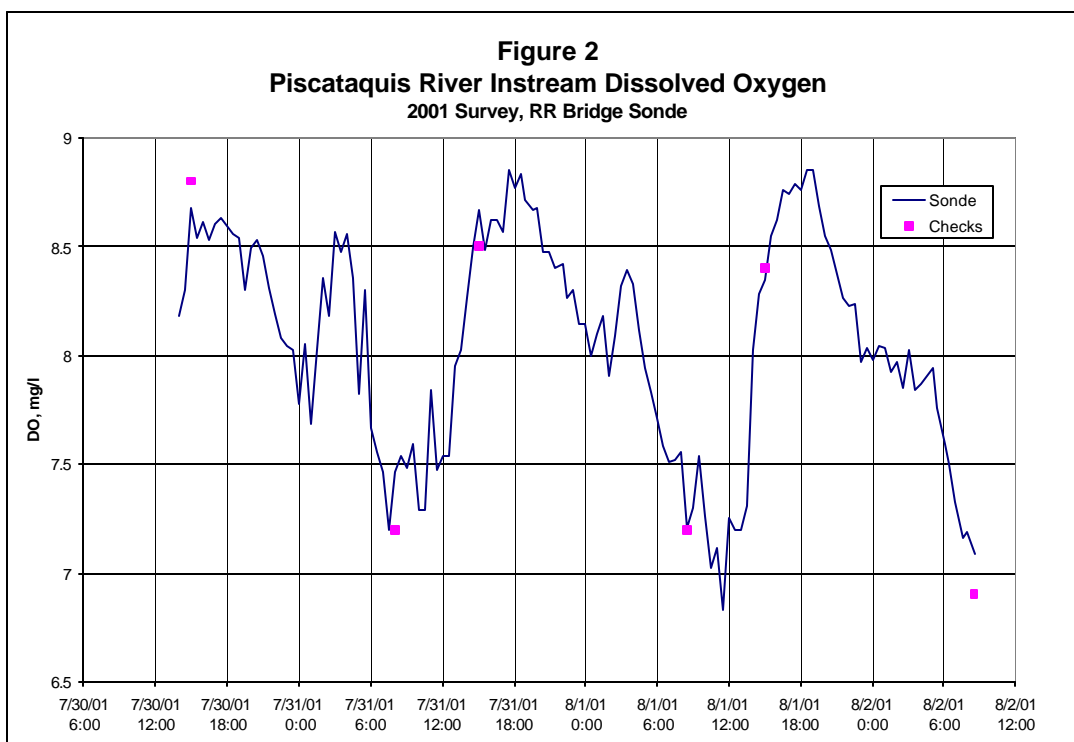
*Below Sebec bridge

All measured 8/23/01 except (*) measured 8/02/01

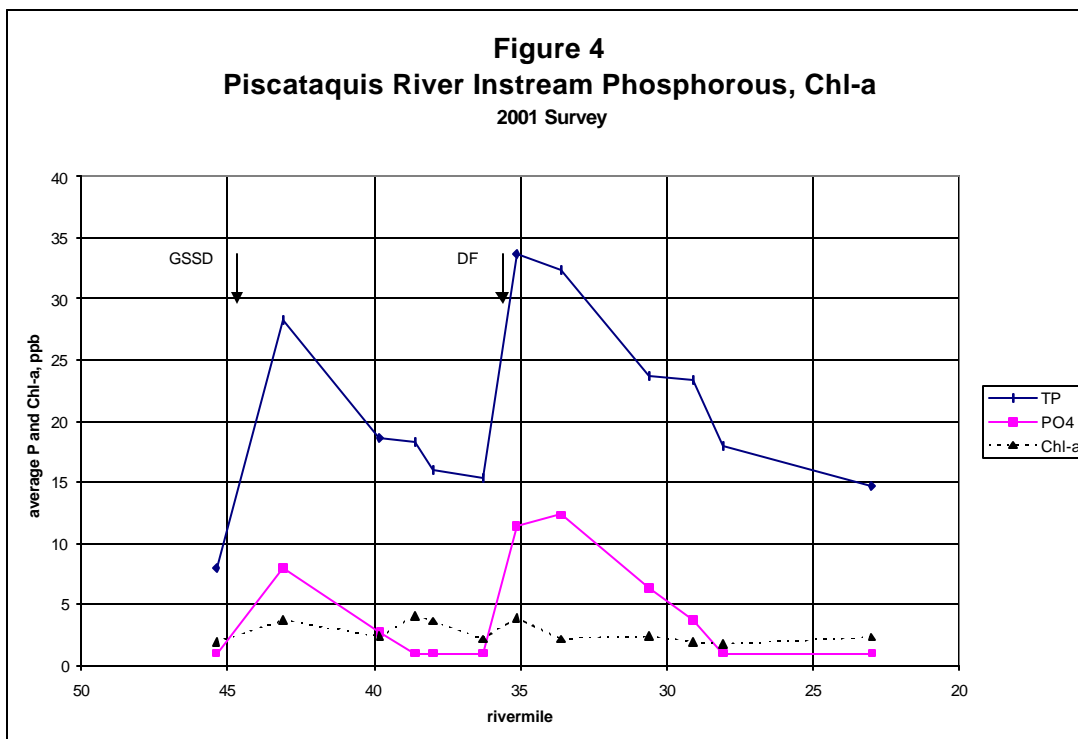
Ambient Chemical Data

The ambient chemical data collected during the July/August 2001 survey included dissolved oxygen (DO), temperature, total phosphorous (TP), orthophosphorous (PO₄), total kjeldhal nitrogen (TKN), ammonia nitrogen (NH₃), nitrite plus nitrate nitrogen (NO_x), chlorophyll a (chl-a), ultimate carbonaceous biochemical oxygen demand (CBOD_u), ultimate nitrogenous biochemical oxygen demand (NBOD_u) and E-coli bacteria. These parameters were sampled/measured during the early morning. These data are included on page A1 in the appendix. In addition, DO and temperature were also measured during the afternoon to capture diurnal effects. These data are included in tables starting on page A2 in the appendix. Two recording sondes were set out for the duration of the three day survey, at the railroad bridge in Dover-Foxcroft and 1 mile below the South Sebec bridge. These instruments recorded DO and temperature at 30 minute intervals. The following charts summarize the DO measurements from the 2001 survey.

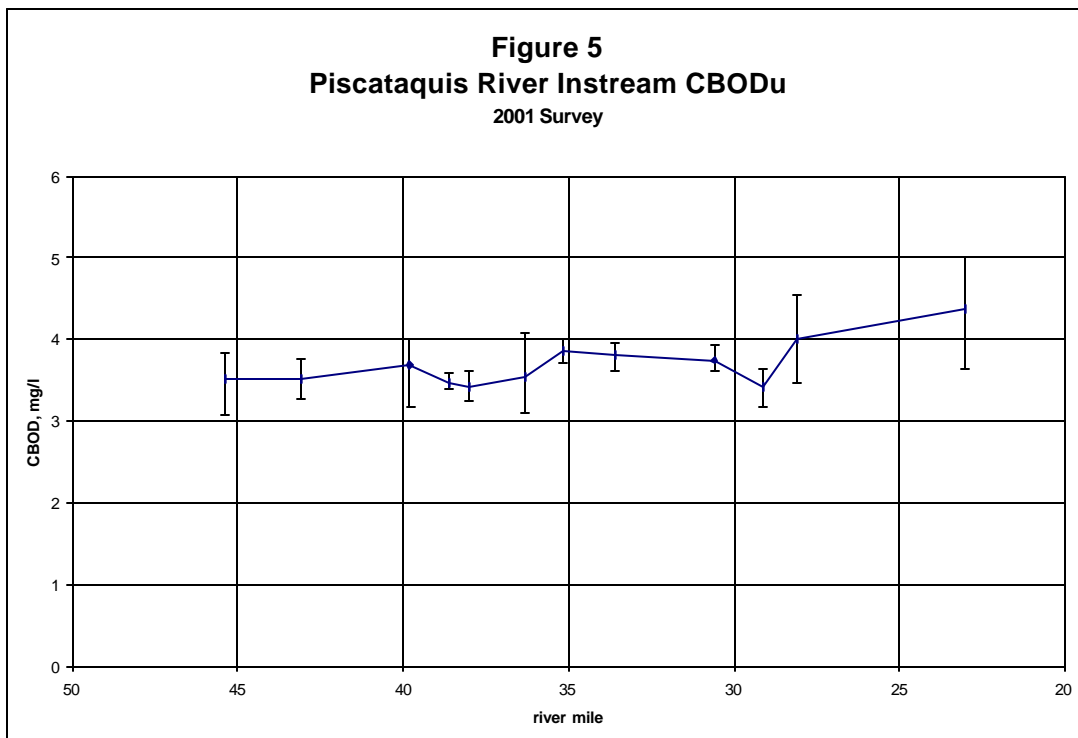




The following figure shows the phosphorous and chl-a results from the 2001 survey.



The following figure shows the instream CBODu results from the 2001 survey.



During August 2000 EPA collected and analyzed SOD samples from the two impoundments in Dover-Foxcroft. The following table summarizes the results.

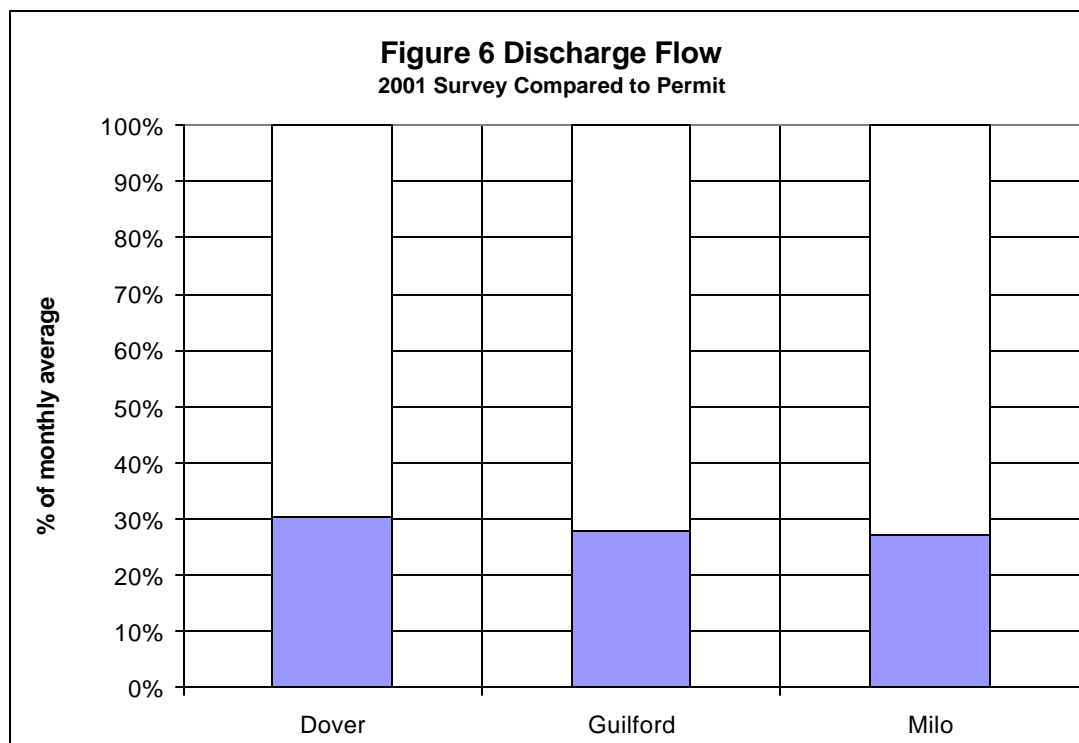
Table 3 Sediment Oxygen Demand

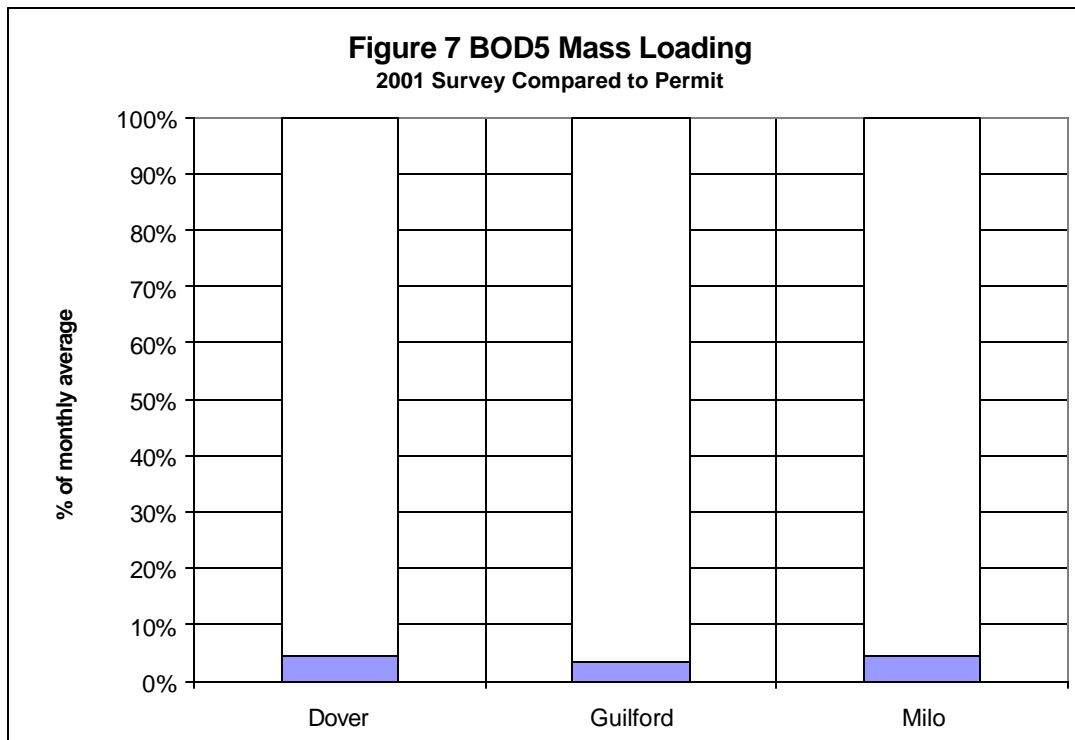
EPA Site	Location	SOD gm/m ² /day
PISC01	upper impoundment near dam	2.58
PISC02	upper imp. 2000' above dam	1.17
PISC03	lower impoundment near dam	1.07

Effluent Data

The treatment plant effluent from the three facilities within the project area was also sampled during the study for total phosphorous (TP), orthophosphorous (PO₄), total kjeldhal nitrogen (TKN), ammonia nitrogen (NH₃), nitrite plus nitrate nitrogen (NO_x), ultimate carbonaceous biochemical oxygen demand (CBOD_u) and ultimate nitrogenous biochemical oxygen demand (NBOD_u), 5 day biochemical demand (BOD₅) and chlorophyll a. The samples were collected as 24 hour composites. These data are included on page A1 in the appendix.

In general the effluent BOD₅ and flow were well below permit requirements (see following charts).





Quality Control

Proper quality control should be followed to assure that all of the data that will be collected are good data. Dissolved oxygen meters were calibrated initially before sampling and checked periodically throughout the day. In addition, the meters of adjacent sampling teams were cross checked both prior to sampling and after completion of sampling to assure the readings from one portion of the river to another are consistent and accurate. The meter readings were required to agree to within 0.3 ppm for DO and to within 2° C for temperature. The results of the cross checks are shown on page A5 of the appendix.

The three-day surveys included ambient and effluent field duplicates. A graphical comparison of the duplicate results is presented in the appendix. In general, the average duplicate variation was within 12% except for the bacteria duplicates which had an average variation of 27% (range: 6.4% - 47.9%). NH₃, NO_x, TP and PO₄ duplicates averaged <5% variation. Lab QAQC is available on request.

Discussion

Most DO measurements indicated DO concentrations above the 7 ppm standard. Exceptions included the bottom readings in the upper impoundment, one morning at the RR bridge and Alder Stream. Large diurnal DO swings (> 2 ppm) were measured below the treatment plant outfalls with the largest occurring below the Dover outfall (> 4 ppm at PR10). Instream chl-a concentrations were not excessive, indicating impact from attached algae. By observation there was increased attached algae below the outfalls as compared with background.

Instream BOD increased slightly below each outfall and there was an increase toward the end of the study segment. Actual loading from the treatment plants was far below permit levels (< 10%).

Instream phosphorous concentrations showed sharp increases below each outfall, followed by rapid decreases (indicative of rapid uptake by plants).

E-coli sampling indicated non-attainment of the average standard (64/100 ml) for class B at Black Stream, Carleton Stream and PR1 (Rt. 23 bridge).

A water quality model for the Piscataquis River will be developed using the data from 1997, 1998 and 2001. The model will be used to evaluate the impact of the permitted discharges (emphasis on BOD, phosphorous) upon instream DO. The impact of non-point sources (in terms of background and tributary sources) will also be examined. A modeling report will follow.

It is still recommended to follow up the dry weather surveys with some wet weather sampling. While this work is not scheduled for 2002, DEP will discuss the possibility of this work being performed by stakeholders with assistance from DEP if funding is available.

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Chemical Data	A1
DO/Temperature Data	A2-A3
USGS Gage Flow (Lowes Br.)	A4
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Station	Date	Time	Secchi (m)	E coli MPN	TKN mg/l	NH3 mg/l	NOx mg/l	TP ppb	PO4 ppb	Chl-a ppb	Chl-a corr. ppb	DEP		STP		TBOD mg/l	NBOD mg/l	CBOD mg/l	final NOx
												BOD5 mg/l	BOD5 mg/l	BOD5 mg/l	BOD5 mg/l				
PR1	07/31/01	6:37	-	66	0.3	0.01	0.01	8	1	2.3*	2.1	-	-	-	-	4.16	0.51	3.7	0.1277
	08/01/01	7:15	-	69	0.4	0.01	0.01	8	<1	1.8*	1.8	-	-	-	-	3.48	0.41	3.1	0.10
	08/02/01	7:05	-	111	0.2	<0.01	0.01	8	<1	1.5*	1.6	-	-	-	-	4.31	0.48	3.8	0.12
CaS	08/01/01	7:25	-	204	0.3	0.02	0.15	19	5	1.6*	1.6	-	-	-	-	2.62	0.39	2.2	0.239
PR2	07/31/01	6:30	-	39	0.3	<0.01	<0.01	22	2	3.6*	3.7	-	-	-	-	4.06	0.54	3.5	0.129
	08/01/01	6:45	-	7	0.3	<0.01	0.03	28	7	4.1*	4.0	-	-	-	-	3.84	0.57	3.3	0.1615
	dupe	6:45	-	11	0.4	0.01	0.03	29	7	3.9*	3.4*	-	-	-	-	3.83	0.52	3.3	0.149
PR4	08/02/01	6:55	-	15	0.3	<0.01	0.06	35	15	3.4*	2.7	-	-	-	-	4.4	0.59	3.8	0.20
	07/31/01	8:03	-	6	0.4	0.01	0.01	20	4	2.1*	2.5	-	-	-	-	4.56	0.56	4.0	0.14
	08/01/01	8:45	-	7	0.3	0.01	<0.01	19	2	2.6*	2.8	-	-	-	-	3.64	0.48	3.2	0.115
BLS	08/02/01	8:25	-	5	0.3	<0.01	<0.01	17	2	2.4*	2.5	-	-	-	-	4.48	0.57	3.9	0.136
	07/31/01	7:13	-	115	0.4	0.01	0.06	16	1	2.8*	2.4	-	-	-	-	4.42	0.45	4.0	0.163
	08/01/01	7:45	-	160	0.4	0.01	0.06	18	2	2.9*	2.3	-	-	-	-	4.22	0.49	3.7	0.174
PR5	dupe	7:45	-	126	0.4	0.01	0.06	17	2	3.5*	2.7	-	-	-	-	4.56	0.52	4.0	0.179
	08/02/01	7:35	-	206	0.4	0.02	0.06	18	2	3.3*	2.4	-	-	-	-	4.34	0.48	3.9	0.17
	07/31/01	7:45	-	6	0.4	<0.01	<0.01	19	<1	4.5*	4.1	-	-	-	-	4.19	0.60	3.6	0.144
PR6	08/01/01	8:30	3.4	0	0.4	<0.01	<0.01	19	1	4.5*	4.3	-	-	-	-	3.96	0.53	3.4	0.1273
	08/02/01	8:10	-	6	0.3	<0.01	<0.01	17	1	3.3*	3.2	-	-	-	-	3.97	0.58	3.4	0.14
	07/31/01	6:00	-	22	0.4	0.01	<0.01	15	<1	3.7*	4.3	-	-	-	-	4.06	0.43	3.6	0.105
PR7	08/01/01	6:15	-	13	0.3	<0.01	<0.01	16	1	3.8*	3.8	-	-	-	-	3.75	0.52	3.2	0.124
	08/02/01	6:15	-	19	0.3	<0.01	<0.01	17	1	3.4*	3.6	-	-	-	-	4.00	0.58	3.4	0.14
	07/31/01	6:00	-	23	0.4	<0.01	0.01	14	<1	2.2*	2.1	-	-	-	-	4.7	0.61	4.1	0.151
PR8	08/01/01	5:55	-	14	0.3	<0.01	<0.01	19	<2	2.3*	1.9	-	-	-	-	3.93	0.48	3.4	0.116
	08/02/01	8:50	-	17	0.3	<0.01	<0.01	13	1	2.0*	1.6	-	-	-	-	3.56	0.45	3.1	0.11
	07/31/01	6:21	-	45	0.4	<0.01	<0.01	35	11	4.5*	4.5	-	-	-	-	4.54	0.54***	4.0***	0.13***
PR9	08/01/01	6:00	-	46	0.3	<0.01	<0.01	33	11	4.1*	3.2	-	-	-	-	4.40	0.52	3.9	0.125
	08/02/01	6:12	-	48	0.4	<0.01	<0.01	33	12	3.1*	2.4	-	-	-	-	4.25	0.54	3.7	0.13
	07/31/01	6:40	-	23	0.4	<0.01	<0.01	40	19	2.3*	2.3	-	-	-	-	4.42	0.56	3.9	0.135
DB	08/01/01	6:13	-	20	0.3	<0.01	<0.01	29	9	2.2*	1.8	-	-	-	-	4.09	0.48	3.6	0.117
	08/02/01	6:24	-	7	0.4	<0.01	0.01	28	9	2.0*	1.8	-	-	-	-	4.53	0.56	4.0	0.14
	08/01/01	6:24	-	36	0.6	<0.01	0.05	25	10	1.5*	1.3	-	-	-	-	5.39	0.44	4.9	0.152
PR10	07/31/01	7:04	-	21	0.4	<0.01	0.01	25	7	2.3*	2.2	-	-	-	-	4.49	0.56	3.9	0.1395
	08/01/01	6:44	-	6	0.3	<0.01	0.01	23	7	2.3*	2.4	-	-	-	-	4.44	0.73	3.7	0.178
	08/02/01	6:46	-	15	0.4	<0.01	<0.01	23	5	2.6*	2.4	-	-	-	-	4.06	0.45	3.6	0.11
GPO	08/01/01	6:38	-	9	0.3	<0.01	0.25	12	3	2.1*	2.1	-	-	-	-	2.53	0.23	2.3	0.30
PR11	07/31/01	7:21	-	36	0.4	<0.01	<0.01	20	3	1.9*	2.1	-	-	-	-	3.30	0.50	2.8	0.1205
	dupe	7:21	-	34	0.4	<0.01	<0.01	20	3	1.6*	1.6	-	-	-	-	4.11	0.56	3.6	0.134
	08/01/01	7:00	-	23	0.3	<0.01	<0.01	30	4	1.9*	2.3	-	-	-	-	3.91	0.50	3.4	0.1205
PR11a	08/02/01	6:58	-	30	0.4	<0.01	<0.01	20	4	1.8*	1.6	-	-	-	-	4.14	0.50	3.6	0.12
	07/31/01	8:32	-	59	0.3	<0.01	<0.01	18	1	1.7*	2.1	-	-	-	-	4.40	0.42	4.0	0.10
	08/01/01	8:47	-	43	0.3	<0.01	<0.01	19	1	1.5*	2.1	-	-	-	-	3.97	0.51	3.5	0.123
PR12	08/02/01	7:57	-	36	0.3	<0.01	<0.01	17	1	2.0*	2.1	-	-	-	-	5.08	0.50	4.6	0.12
	dupe	7:58	-	24	0.3	<0.01	<0.01	18	1	2.0*	2.1	-	-	-	-	4.93	0.41	4.5	0.10
	07/31/01	8:04	-	13	0.4	<0.01	<0.01	15	1	2.3*	2.6	-	-	-	-	5.09	0.60	4.5	0.143
AIS	08/01/01	7:23	-	12	0.3	<0.01	<0.01	15	<1	2.3*	2.2	-	-	-	-	4.14	0.51	3.6	0.123
	08/02/01	7:31	-	3	0.3	<0.01	<0.01	14	1	2.4*	2.7	-	-	-	-	5.37	0.37	5.0	0.09
	08/01/01	7:35	-	0	0.7	0.01	0.03	24	3	2.6*	1.8	-	-	-	-	5.00	0.58	4.4	0.165
Guilford	07/31/01	comp.	-	-	3.7	0.16	17.0	3700	3300	27.0	22.7	5.1	2.4	-	-	27.5	0	27.5	16.942
	08/01/01	comp.	-	-	3.5	0.2**	17.0	3700	3400	21.2	17.6	5.8	4.9	-	-	22.4	0	22.4	15.476
	dupe	comp.	-	-	3.5	0.2**	17.0	3700	3300	22.7	18.2	5.8	-	-	-	21.2	0	21.2	15.619
Dover	08/02/01	comp.	-	-	3.5	0.2**	16.0	3600	3400	26.5	21.9	4.2	3.6	-	-	30.6	0	30.6	16.0
	07/31/01	comp.	-	-	4.3	2.1	1.4	3400	3200	45.1	27.0	4.2	-	-	-	35.3	22.1	13.2	6.5
	dupe	comp.	-	-	4.5	2.1	1.4	3500	3200	34.5	19.4	4.8	-	-	-	37.5	23.6	14.0	6.8
Milo	08/01/01	comp.	-	-	3.8	2.0	1.4	3500	3200	52.9	32.3	4.0	5.0	-	-	24.4	12.0	12.4	4.2
	08/02/01	comp.	-	-	4.0	2.2	1.4	3600	3300	48.3	27.0	3.4	4.0	-	-	34.6	12.6	22.0	4.3
	dupe	comp.	-	-	3.8	2.2	1.4	3500	3300	42.2	22.4	2.8	-	-	-	29.7	10.8	18.9	3.9
Milo	08/01/01	comp.	-	-	4.0	1.1	8.8	3100	2900	63.9	30.7	8.9	5.0	-	-	33.2	7.7	25.5	10.567

*method outside range of STD METH 20

**diluted

***final NOx assumed

Date: 07/31/01					
Station		Depth m	DO mg/l	Temp °C	% Sat
PR1	06:37	mid	7.6	20.6	84.6%
	14:07	mid	8.5	25.2	103.2%
PR2	06:30	mid	8.2	21.9	93.6%
	14:00	mid	9.6	24.6	115.3%
PR4	08:03	0	7.2	22.2	82.7%
		1	7.2	22.2	82.7%
	14:54	0	8.1	24.8	97.7%
		1	8.5	24.1	101.2%
PR5	07:45	0	8.0	22.2	91.8%
		1	7.9	22.3	90.9%
		2	7.4	22.3	85.1%
		3	1.6	19.4	17.4%
	14:43	0	8.7	24.2	103.7%
		1	9.0	23.0	104.9%
		2	8.6	22.5	99.3%
		3	6.6	21.6	74.9%
PR5a	06:13	0	7.9	22.3	90.9%
		1	7.4	22.2	85.0%
	13:45	0	8.5	23.0	99.1%
		1	8.5	23.0	99.1%
PR6	06:00	0	7.6	22.8	88.3%
		1	7.6	22.8	88.3%
		2	7.6	22.8	88.3%
		3	7.0	22.7	81.1%
	13:35	0	8.1	24.1	96.4%
		1	8.2	23.4	96.3%
		2	8.4	23.0	97.9%
		3	8.2	22.8	95.2%
PR6a	05:50	mid	7.7	22.6	89.1%
	13:25	mid	8.7	24.8	104.9%
CaS	6:58	mid	7.8	18.9	83.9%
	14:14	mid	8.1	25.7	99.3%
BIS	07:13	mid	7.8	19.2	84.4%
	14:25	mid	8.4	25.7	103.0%
PR7	06:00	mid	7.3	19.9	80.1%
	13:15	mid	9.8	27.7	124.5%
PR8	06:21	mid	7.3	22.2	83.8%
	15:22	mid	10.2	24.9	123.2%
PR9	06:40	mid	7.7	21.5	87.2%
	15:13	mid	10.3	25.8	126.5%
PR10	07:04	mid	8.0	20.9	89.6%
	14:56	mid	10.9	27.5	138.0%
PR11	07:21	mid	7.6	20.2	83.4%
	14:42	mid	9.5	26.4	117.9%
PR11a	08:32	mid	8.4	22.05	96.4%
	14:34	mid	8.5	24.0	101.0%
PR12	08:04	0	7.8	22.0	89.2%
		1	7.35	21.8	83.7%
	14:12	0	8.15	25.0	98.6%
		1	8.5	23.8	100.6%
		2	8.6	22.8	99.9%
PR13	06:30	mid	7.4	22.2	84.6%
	13:40	mid	7.8	23.9	92.5%
DB	06:50	mid	8.7	16.7	89.5%
	15:05	mid	8.0	22.6	92.6%
GPO	07:02	mid	9.1	15.6	91.4%
	14:54	mid	8.7	22.7	100.8%
SeR	06:15	mid	7.6	22.1	87.3%
	13:50	mid	8.1	25.2	98.4%
AIS	07:58	mid	6.5	19.7	71.1%
	14:06	mid	7.1	25.8	87.2%

Date: 08/01/01					
Station		Depth m	DO mg/l	Temp oC	% Sat
PR1	07:15	mid	7.6	20.5	84.4%
	14:02	mid	8.3	25.7	101.7%
PR2	06:45	mid	8.3	22.5	95.8%
	13:50	mid	9.0	25.0	108.9%
PR4	08:45	0	7.2	23.5	84.7%
		1	7.2	23.4	84.6%
	14:55	0	8.0	26.8	100.0%
		1	8.4	24.7	101.1%
PR5	08:30	0	8.5	23.4	99.8%
		1	8.5	23.4	99.8%
		2	7.9	22.6	91.4%
		3	4.7	19.4	51.1%
	14:40	0	8.5	27.1	106.9%
		1	8.8	24.3	105.1%
		2	8.4	23.6	99.0%
		3	6.5	22.1	74.5%
PR5a	06:30	0	7.9	23.3	92.6%
		1	7.9	23.3	92.6%
	13:35	0	8.2	24.9	99.0%
		1	8.3	24.9	100.3%
PR6	06:15	0	8.0	23.1	93.4%
		1	8.1	23.1	94.6%
		2	8.0	23.1	93.4%
		3	7.5	22.8	87.1%
	13:23	0	8.0	25.6	97.9%
		1	8.4	23.9	99.6%
		2	8.1	23.2	94.8%
		3	7.9	22.9	91.9%
PR6a	06:05	mid	7.9	22.8	91.7%
	13:15	mid	8.6	24.9	103.9%
CaS	7:25	mid	7.2	19.0	77.6%
	14:08	mid	7.7	27.2	97.0%
BIS	07:45	mid	7.8	19.5	84.9%
	14:20	mid	8.2	27.0	102.9%
PR7	05:55	mid	7.3	20.5	81.1%
	13:05	mid	9.6	27.8	122.2%
PR8	06:00	mid	7.2	23.6	84.9%
	15:17	mid	10.0	27.0	125.5%
PR9	06:13	mid	7.9	23.0	92.1%
	15:08	mid	10.2	27.6	129.4%
PR10	06:44	mid	7.6	21.3	85.7%
	14:45	mid	11.15	29.35	145.9%
PR11	07:00	mid	7.1	21.5	80.4%
	14:32	mid	9.8	27.5	124.1%
PR11a	08:47	mid	8.2	24.0	97.4%
	14:22	mid	8.45	26.1	104.3%
PR12	07:23	0	7.5	22.2	86.1%
		1	7.3	22.3	84.0%
	14:05	0	8.1	26.8	101.3%
		1	8.5	24.7	102.3%
PR13	06:47	mid	7.6	23.1	89.0%
	13:35	mid	8.05	25.3	98.0%
DB	06:24	mid	8.4	16.6	86.2%
	15:01	mid	7.8	23.3	90.9%
GPO	06:38	mid	9.1	15.3	90.8%
	14:43	mid	8.4	23.8	99.4%
SeR	06:33	mid	8.0	23.2	93.8%
	13:45	mid	8.0	26.1	98.8%
AIS	07:35	mid	6.2	20.1	68.3%
	14:00	mid	6.7	27.7	85.1%
Salmon Stream	-	mid	-	-	-
	13:45	mid	8.4	21.1	94.4%
Guilford	07:07	-	8.1	23.5	95.3%
	-	-	-	-	-

Date: 08/02/01					
Station		Depth m	DO mg/l	Temp oC	% Sat
PR1	07:05	mid	7.3	21.4	82.5%
	13:39	mid	8.4	26.2	103.9%
PR2	06:55	mid	8.4	23.4	98.7%
	13:31	mid	10.6	27.6	134.5%
PR4	08:25	0	6.8	24.5	81.5%
		1	6.9	24.4	82.6%
	14:18	0	8.1	26.4	100.6%
		1	7.7	25.7	94.4%
PR5	08:10	0	8.3	24.3	99.1%
		1	8.3	24.3	99.1%
		2	7.9	23.3	92.6%
		3	4.9	21.3	55.3%
	14:10	0	8.7	27.3	109.8%
		1	8.9	26.5	110.7%
		2	8.9	25.2	108.1%
		3	4.0	20.2	44.2%
PR5a	06:34	0	7.6	24.3	90.8%
		1	7.6	24.3	90.8%
	13:16	0	8.1	26.2	100.2%
		1	8.0	26.2	99.0%
		2	7.4	26.3	91.7%
PR6	06:15	0	7.9	24.2	94.2%
		1	7.8	24.2	93.0%
		2	7.5	24.0	89.1%
		3	7.7	23.0	89.8%
	13:07	0	8.1	26.8	101.3%
		1	8.1	25.5	98.9%
		2	8.3	24.3	99.1%
PR6a	06:07	mid	7.7	23.8	91.1%
	13:02	mid	8.6	25.9	105.8%
CaS	7:18	mid	7.6	19.7	83.1%
	13:44	mid	8.0	27.3	100.9%
BIS	07:35	mid	7.3	20.2	80.6%
	13:55	mid	8.5	28.1	108.8%
PR7	05:50	mid	6.9	21.0	77.4%
	12:53	mid	9.6	28.3	123.3%
PR8	06:12	mid	7.0	24.1	83.3%
	12:53	mid	9.4	27.4	118.8%
PR9	06:24	mid	7.5	24.1	89.3%
	13:02	mid	9.7	27.3	122.4%
PR10	06:46	mid	7.3	22.7	84.6%
	13:29	mid	11.8	29.9	155.8%
PR11	06:58	mid	7.0	22.9	81.4%
	13:38	mid	9.2	27.6	116.7%
PR11a	07:57	mid	8.2	24.7	98.7%
	11:05	mid	8.2	26.0	101.1%
PR12	07:31	0	7.7	23.2	90.1%
		1	7.5	23.3	87.9%
	14:45	0	8.8	26.8	110.0%
		1	9.2	24.9	111.1%
PR13	06:30	mid	7.3	23.9	86.6%
	13:59	mid	8.1	26.4	100.6%
DB	06:33	mid	8.45	17.9	89.1%
	13:09	mid	8.1	24.3	96.8%
GPO	06:43	mid	9.0	16.1	91.4%
	13:24	mid	9.2	25.9	113.2%
SeR	06:15	mid	7.55	23	88.0%
	14+/-	mid	7.7	26.6	95.9%
AIS	07:24	mid	6.0	21.0	67.3%
	14:35	mid	6.4	29.0	83.2%
Salmon Stream	06:43	mid	7.8	17.4	81.4%
	13:27	mid	8.3	22.3	95.5%

